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Competition and welfare

Jan Boone*

Abstract

This article proposes a new definition of competition, emphasizing that competition impacts the way firms interact in an industry. This definition is illustrated with four policy measures, recently proposed by the Dutch government, that affect competition. Finally, the article considers the welfare effects of more intense competition.

Samenvatting

Dit artikel bespreekt een nieuwe definitie van marktwerking, die benadrukt dat marktwerking de manier beïnvloedt waarop ondernemingen onderling concureren. Ter illustratie van deze definitie, worden vier recente beleidsvoorstellen besproken die meer marktwerking beogen. Ten slotte worden de welvaarts effecten van meer marktwerking geanalyseerd.

Introduction

Markets are generally believed to be efficient institutions in organizing production and exchange in an economy. One justification for this is based on the notion of competition. Indeed, it is often claimed that 'more competition' makes markets more efficient. The problem, however, is that it is unclear what is meant by 'more competition.'

On the one hand, there is the abstract notion of (perfect) competition, which implies that firms act as price takers. Although this idea has been precisely defined theoretically, it is of little use in practice. In reality, firms do not act as price takers, while it is unclear how competition in this sense can be enhanced. On the other hand, there is a wide variety of policy variables that affect competition; at first glance, however, it is unclear what they have in common.

This paper makes a first attempt to define competition in such a way that one can meaningfully talk about 'more competition.' Subsequently, the impact of four policy instruments on competition are discussed. It is argued that these variables can be used to raise competition in the sense defined in this paper. For instance, increasing the number of taxi permits sold in a city intensifies competition in the taxi market. Alternatively, liberalizing shopping hours in the retail sector increases competition between shops. These examples illustrate that the definition of competition in this paper is a good starting point for analyzing the effects of policy decisions on competition.

Finally, I analyze under which conditions more competition indeed makes markets more efficient in the sense that it raises welfare.

This paper is structured as follows. The next section introduces the specific concept of competition that will be used. Section 3 illustrates this definition with policy vari-

ables. Section 4 analyses how a change in intensity of competition affects the market outcome and thereby social welfare. Finally, section 5 concludes.

Defining competition

Why do we need a new definition of competition? Some readers may argue that market concentration (measured by, for instance, the Herfindahl index or the concentration ratio) is a good way to define competition. More competition then implies less market concentration. From a policy point of view, market concentration suffices as an appropriate measure of competition if the focus is on stimulating entry. If the government removes (regulatory or other) entry barriers, more firms will enter the market, and competition is enhanced. In this case, the rise in competition is reflected in a fall in market concentration.

However, a number of policy variables influence competition without directly affecting entry. For instance, liberalizing shop opening hours clearly increases the intensity of competition between shops by removing (time) constraints on consumers' search behavior. However, it is not aimed at increasing the number of firms in the sector. On the contrary, as argued below, liberalizing shopping hours is likely to raise market concentration. Similarly, abolishing the minimum price in the daily newspaper industry will increase price competition between publishers and hence may drive some less efficient firms out of the market, thereby increasing market concentration.

In these two examples, policy does not affect competition by (directly) changing the number of players in the market but by changing the way players interact. Then, a policy change is said to enhance competition if it induces players to act more aggressively, lowering prices and/or increasing their output levels. If competition is seen from this perspective (as it is in this paper), market concentration is not a good measure of competition since market concentration is determined endogenously by the cost and demand structures in the industry and the way firms interact.

In particular, a policy measure is said to increase the intensity of competition in an industry, if it meets the following conditions (C1)-(C4):¹

- (C1) reduces total industry profits,
- (C2) reduces the profit level of the least efficient active firm and increases that of the most efficient firm (the so-called leader) if it is far enough ahead of its opponents,
- (C3) increases total industry output and
- (C4) reduces the output level of firms that feature much higher costs than the leader.

This definition of competition may look unfamiliar. The idea is that competition is defined in terms of its effects on output and profit patterns. For instance, if all firms in the industry are homogeneous, the definition implies that stronger competition raises total industry output and reduces total industry profits.

The definition incorporates the realistic case in which firms are heterogeneous. In that case, the definition im-

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poses restrictions on how more intense competition affects the production allocation of industry-wide output over efficient and inefficient firms and on how it affects the distribution of profits over such firms.

Illustrating more competition

To illustrate the definition provided in the previous section, this section considers the following four policy experiments, which have received much attention in the Dutch policy debate: abolish the minimum price in the daily newspaper market, liberalize shop opening hours, increase the number of taxi permits in a city, and allow workers and firms to select their own pension fund or insurance company.

Minimum price for newspapers

As described by Rekko (1996), the Dutch daily newspaper market is characterized by a cartel dictating (among other things) a minimum price for yearly subscriptions. Competition in this market can be increased by abolishing this minimum price. What would be the effects of such a rise in competition? First, assuming that the minimum price is not above the price that maximizes joint profits, one would expect total industry profits to fall. In other words, abolishing the minimum price satisfies condition (C1). Second, abolishing the minimum price will reduce the profits of the least efficient or least popular newspapers. In fact, protecting these weak newspapers is precisely the justification given by the cartel for its minimum price. Further, the most popular newspaper, *de Telegraaf*, may profit by using very low prices to attract readers. Such a profit gain can materialize only if the *Telegraaf* is far more popular and efficient than the other newspapers are. Indeed if all newspapers would be equally efficient and popular, condition (C1) would imply that each firm's profits would be reduced by a rise in competition. Furthermore, abolishing the minimum price will result in more newspapers being sold overall. However, if one of the weaker papers, such as *het Parool*, is not able to reduce its price in line with the other papers, it may well lose sales after the minimum price has disappeared.

Shopping hours

Allowing shops to be open in the evenings and on Sundays, yields two effects. First, consumers have more time to buy products and hence will spend more money. The size of this effect is controversial. Although some proponents of this measure claimed that this effect would be quite large, no clear evidence exists that this is indeed the case. I focus on the second effect related to competition. Longer shopping hours allow consumers to search longer for the product they desire. For expositional purposes, I'll concentrate on the case in which consumers search for the cheapest product. The liberalization of shopping hours implies that firms have to compete more aggressively on price. Since consumers can spend more time to find the cheapest product, they will visit more shops, and it thus becomes more likely

that they will find a cheaper shop. Hence each shop owner has a larger incentive to reduce prices. Consequently, industry profits will be reduced. Furthermore, very efficient shops will find that more consumers will visit them and buy more from them because their efficiency allows them to set low prices. This will increase their profits, if they are far more efficient than their competitors. Not surprisingly, therefore, one of the most efficient supermarket chains, Albert Heijn, favored the liberalization of shopping hours. Conversely, most small shops opposed this measure. Indeed, it is likely to reduce their profits as they lose customers to the more efficient and cheaper supermarket chains. As noted above, the measure has boosted total industry output but it is not clear by how much. The small shops have seen their output levels reduced and most of them do not even use the new possibilities of selling in the evenings or on Sundays. For a more detailed analysis of the economic effects of liberalizing shopping hours, see Bernardt (1997).

Taxi permits

One measure contemplated to intensify competition in the taxi sector, is for the government to sell more taxi permits. This is not necessarily the same as raising the number of firms in the taxi sector, since an existing taxi firm may buy permits to expand its fleet. More taxis driving around imply more competition and hence lower prices and industry profits. In the taxi sector, most firms are more or less equally efficient. There are no massive economies of scale or scope, and taxis are rather homogeneous both in what they offer and in what they cost. Hence, the distribution and allocation effects between firms will be limited. Finally, more taxis and lower prices will raise output, measured as total taxi kilometers travelled per week.

Pension contributions

As described by Eichholtz and Koedijk (1996), firms and employees in most Dutch industries cannot freely select their pension fund or insurance company at which they deposit their pension contributions. One way to enhance competition in the pension branch would be to allow each firm or even each employee to select their preferred pension fund or insurance company. What would be the effects of such a policy change? First, pension funds and insurance companies would compete more on the returns on pension deposits. If one insurance company would be far more efficient than the other firms, it would attract more customers, thereby increasing its output and profits.² Conversely, firms and employees that were formerly linked to an inefficient pension fund would leave this fund for a more attractive offer from other funds or insurance companies. For such inefficient pension funds, the policy change would reduce output. Finally, to the extent that the rise in competition raises returns on pension funds, employers and employees might decide to increase their pension contributions, thereby increasing industry output.

Competition and welfare

Consider a market with a number of firms, where each firm produces its own (possibly heterogenous) product and its production process features a per period fixed cost. Why would the actual outcome differ from the social optimum? I focus on five externalities associated with a rise in competition, which may affect social welfare.

First, if the production process features strong economies of scale, there may be excess entry. With strong economies of scale, a social planner prefers a small number of firms, each of which produces at low unit costs. In the actual outcome, too many firms may have entered, each producing at excessively high unit costs. I will call this the *economies of scale* effect. Second, if firms produce differentiated goods, and each firm has its own specific product, there may be too little entry. This will happen if consumers exhibit a strong taste for variety and firms cannot appropriate the entire consumer surplus, because perfect price discrimination is not possible. In this case, entry by a firm is socially desirable but unprofitable. This is coined the *appropriability* effect. Third, if the firms in the observed outcome have monopoly power, it is likely that they produce too little output from a social point of view. This is called the *monopoly power* effect. These first three effects are well known from papers by Dixit and Stiglitz (1977) and Mankiw and Whinston (1986).

The final two effects deal explicitly with the case in which the firms in the market are heterogeneous in their efficiency levels. In particular, if firms are not all equally efficient, there are two additional reasons why the actual outcome may deviate from the social optimum. First, for a given level of total industry output, the social planner would like to allocate production to the most efficient firms in the market. In the actual outcome, therefore, inefficient firms may produce too much from a social point of view. This is called the *allocation* effect. Finally, the *distribution* effect says that total industry profits should be distributed in such a way that the most efficient firms enter the market. This last effect can be found also in Vickers (1996).

To analyze the effects of competition on these externalities, I return to the four policy experiments introduced in the section above. Abolishing the minimum price in the daily newspaper market will reduce total industry profits (see condition (C1)). This will reduce the number of firms that can recover their fixed costs. Hence, abolishing the minimum price may force some newspapers to exit the market. In so far as economies of scale are important in the daily newspaper market, this will enhance welfare. Indeed, a smaller number of firms producing at lower unit costs is cost efficient from a social point of view. However, perhaps more likely, if consumers appreciate the variety in newspapers, the rise in competition may push some newspapers out of the market that are no longer profitable but still socially desirable. In other words, a rise in competition exacerbates the appropriability effect. This is, in fact, the only

welfare effect of the five above that argues against a rise in competition. As a rise in competition increases total industry output by (C3), it mitigates the lack of output due to the monopoly power effect. Finally, because of (C2) and (C4), a rise in competition reallocates production away from the least towards the most efficient firms in the market and redistributes profits in the same way. Hence, it becomes more likely that the most efficient firms stay in the market and will produce a large share of the output. This boosts welfare through the allocation and distribution effects.

Similar results hold with respect to the shopping hours, taxi permits and pension contributions examples. A rise in competition can reduce welfare only through the appropriability effect. In so far as the consumers perceive shops, taxis and pension funds as homogeneous and only value the best service at the lowest price, the appropriability effect is absent. In that case, a rise in competition unambiguously raises welfare.

Conclusion

This article has analyzed the relationship between the intensity of competition and welfare. In the policy debate it is often unclear what people mean by competition. Therefore, this article has proposed a precise definition, where intensity of competition is defined in terms of its effects on industry output and profit patterns. Four examples of actual policy measures suggest that a rise in the intensity of competition can reduce welfare only if consumers feature a strong taste for variety. Other effects of intensified competition, such as promoting economies of scale by reducing the number of firms in the industry, increasing total output, and allocating production and distributing profits to the most efficient firms, all work in the direction of enhancing welfare. ■

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Notes

- ¹ The effect of competition on firms' incentives to improve their products and production technology is missing here. The interested reader is referred to Boone (1997).
- ² Note that one cannot speak of profits for pension funds, since with pension funds, unlike insurance companies, one cannot distinguish customers and shareholders.